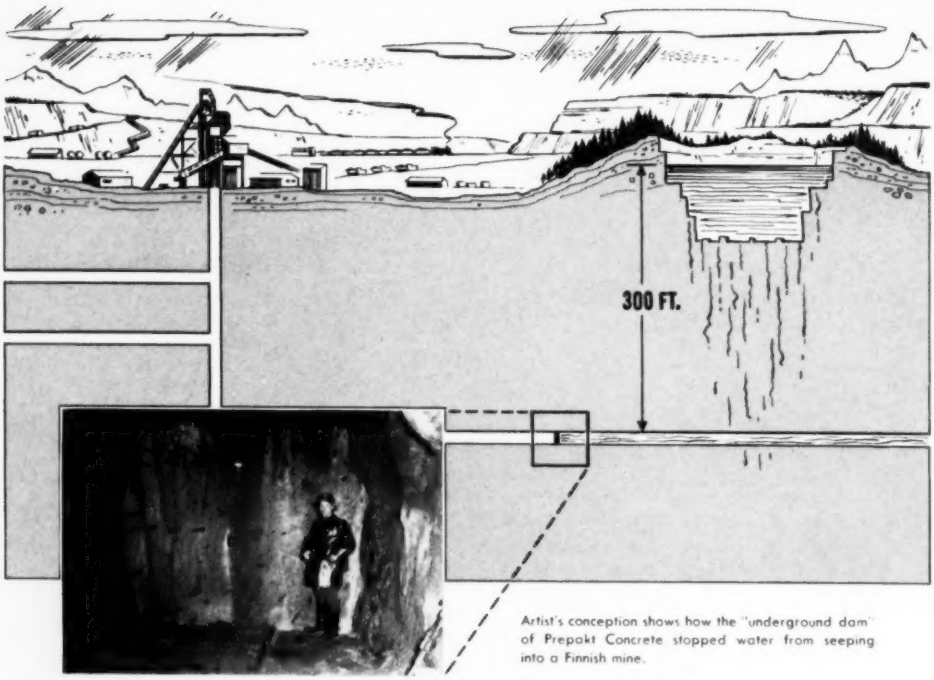
ACI News Letter

Vol. 24, No. 9 JOURNAL of the AMERICAN CONCRETE INSTITUTE May 1953



Artist's conception shows how the "underground dam" of Prepakt Concrete stopped water from seeping into a Finnish mine.

Mine tunnel plug of Prepakt Concrete withstands water pressure of 130 psi.

PREPAKT IS BEST FOR *UNDERGROUND* DAMS, TOO!

High-strength Prepakt Concrete—with recognized advantages for the construction and maintenance of conventional dams—has also demonstrated its superiority for "underground dams".

In this case the "underground dam" was a tunnel plug deep in a Finnish mine. It was constructed by one of Finland's largest mining companies to end a constant pumping problem caused by water entering the mine from a nearby open quarry.

The Prepakt Concrete plug consists of a 13-foot square reinforced cross wall built by preplacing coarse aggregate in forms, then pumping voids full with Intrusion mortar. Over six feet thick, this "underground dam" withstands a 300-foot hydrostatic head and has created a sizeable surface lake.

The absence of setting shrinkage of Prepakt Concrete and its high-strength bond with the complete tunnel surface (including the roof) produced an unusual and highly successful application.

Full information on this and other applications of Prepakt Concrete may be obtained from the Main Office, Cleveland, Ohio.

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ACI

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May 1953

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ACI FINANCES

Vital to the continuation of ACI's services to its members and to public interests in good concrete practices is a sound financial structure and foresighted planning for effective utilization of available funds. Your Board of Direction has an eye to the future as well as to current needs in adopting annual budgets authorizing disposition of income.

The balance sheet of the Institute as of December 31, 1952, lists assets of $100,250 and liabilities including accounts payable and reserves of $11,026 leaving a general fund surplus of $89,223 which amounts to 58 percent of the 1953 operating budget. It is the aim of the Board of Direction to gradually increase surplus to equal one year's expenses and eventually, for sound financial stability, to equal two years' outgo as generally considered desirable for similar organizations. Not included in the general surplus is the retirement reserve of $30,370, Turner Trust Fund (Turner Medal) $2454, and Alfred E. Lindau Fund (Lindau Medal) $4152.

Income in 1952 was $178,238 derived as shown in the pie chart in Fig. 1. Member dues and

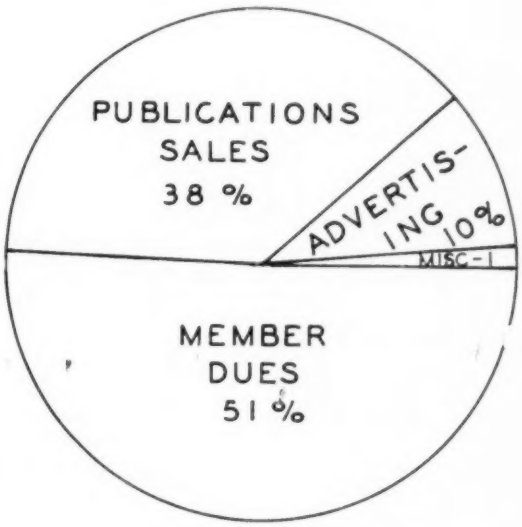

Fig. 1—ACI income for 1952

sales of publications accounted for 89 percent of income with member dues providing just over half of total Institute financial support. During 1952 there was a net increase in membership of 462 with the year-end total at 5972. Emphasizing the continuing importance of *member consciousness*, the principal source of new members continues to be the efforts of individual members. This despite a vigorous campaign by the Membership Committee and staff through the media of "stockholder letters," welcome letters at convention and regional meeting, limited free circulation of the JOURNAL, and follow-up of nonmember purchasers of ACI publications.

Principal expense items in 1952 are charted in Fig. 2. Publication costs, including the JOURNAL, bound volumes, special publications, and reprints, represent almost a third of ACI expenses, salaries were 31 percent and general expenses, including office expense, furniture, travel, taxes and other like items, were 20 percent of the total outgo. Since the adoption of an employee retirement plan in 1949 approximately 10 percent of the salary item in the budget has been set aside to build up the retirement fund. Other expenses are as shown in Fig. 2.

Outlook for 1953

Estimates for the present year indicate little change in the percentage and dollar value of income from member dues, publication sales, and advertising. A reduction in member dues receipts because of a change in billing dates is expected to be just about offset by the increase in new members based on last year's rate of growth. Income from publications sales will be influenced by when publications now in process become available for sale but in any case is expected to be near the 1952 amount.

Expenses for 1953 are forecast at about 15 percent above those for the previous year with principal increases being in the JOURNAL, reprints, furniture and equipment, and—to a lesser extent—the salary items. The biennial Directory is an added item over last year amounting to $3600. Despite these added costs a modest amount is expected to be added to the general surplus at the end of the year.

Because the budget is on a calendar year basis and the JOURNAL volume year runs from September to June, comparisons of JOURNAL budgets and contents are difficult to make and of doubtful value. However, it is interesting to note that in *Proceedings* V. 48 (932 pp. not counting discussion)

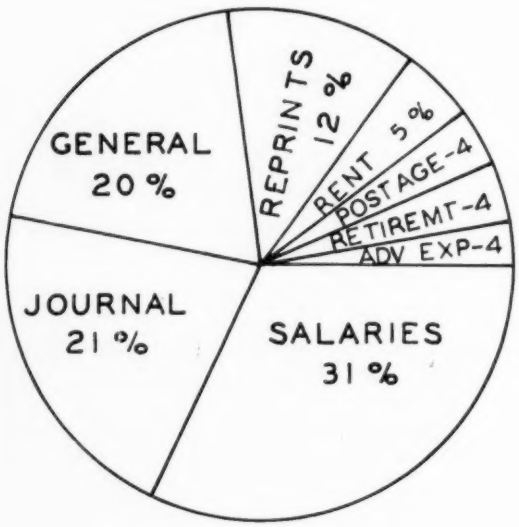

Fig. 2—ACI expenses for 1952

which ended June, 1952, there were 56 technical papers of which 25 were on design, 14 on research, 14 on construction, and 5 in the general category. V. 49 ending June, 1953, is expected to contain 15 papers on design, 22 on research, 24 on construction, and 8 general for a total of 68 papers requiring 976 pages including indexes but not discussion.

Thus the increasing cooperation of members and others interested in promoting good concrete practice has made it possible to be of greater service to members through an enlarged JOURNAL coverage. Equally important, through enrollment of new members, are those Institute faithful who provide the financial backing to make plans a reality. Their continuing efforts—bolstered by an awakened interest of others not yet taking an active part in member-getting—are the foundation of a sound Institute.

Denver committee named for ACI's Golden Anniversary Convention

R. F. Blanks, vice-president and general manager of Great Western Aggregates, Inc., Denver, Colo., has announced the roster of Denver convention committee for ACI's Golden Anniversary Convention in Denver, Feb. 22-25, 1954. Mr. Blanks is chairman and the executive committee includes E. W. Thorson, vice-chairman, district engineer, Portland Cement Assn.; Orley Phillips, treasurer, engineer with R. J. Tipton & Associates, Inc.; and W. H. Price, secretary, head of Engineering Materials Laboratory, U. S. Bureau of Reclamation.

The various task committees and chairmen are as follows: finance and exhibits—Mr. Phillips; technical program—Mr. Price; publicity—S. H. Poe, engineer and technical editor, USBR; reception and registration—Damon Runyon, consulting engineer, Longmount, Colo.; entertainment—R. F. McCune, general manager, J. L. Peterson, Inc.; field trips and transportation—A. J. Ryan, Crocker & Ryan; printing—R. W. Morris; tickets—B. W. Lorance, chief structural engineer, T. H. Buell and Co.; and membership—E. C. Higginson, head, Concrete Laboratory Section, USBR.

The ladies committee includes Mrs. W. H. Price, chairman, Mrs. E. W. Thorson, and Mrs. R. F. Blanks.

Vacuum concrete conference

Various applications of the vacuum concrete process, with emphasis on precast flumes for irrigation canals, were discussed at the Second International Vacuum Concrete Convention, held May 4-9 in Rome, Italy.

Karl P. Billner, president, Vacuum Concrete Inc., Philadelphia, Pa., reported that about 500 miles of precast irrigation flumes are being used in Italy. Similar large irrigation projects are under way in Morocco, Algeria, and Spain, totaling almost 2000 additional miles of precast flumes. Various aspects of such construction were reported by R. Gramigna, I. Leviant, and T. Delfini.

The convention also featured discussions of other projects. Mr. Billner reported that applications of the vacuum process included such projects as the U. S. Navy base on the Island of Guam; power and irrigation canals on the Rhone and Rhine rivers in France; a prefabricated multistory housing project at Heliopolis, Egypt; mine structures and housing in South Africa; industrial plants in Canada; low cost housing in South America; the new Mont-Blanc Centre building in Geneva, Switzerland; and manufacture of large pipe (each weighing 60 tons) in Italy.

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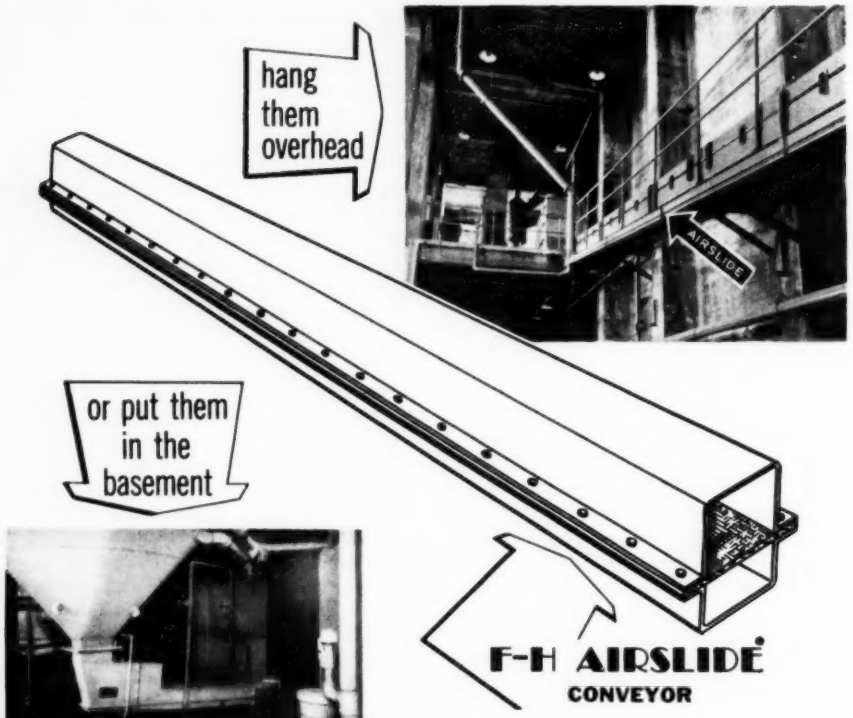

F-H Airslide Conveyors can be designed and installed to avoid structural obstacles and production equipment—allow for much needed, valuable space in the plant. They permit economy in location without the restrictions or straight-line limitations of mechanical conveyors. Alternate straight and curved sections result in freedom of location, subject only to headroom required to allow for proper slope for moving the material. The Airslide operates on the principle of fluidizing dry, fine materials, with low-pressure air, so that they flow by gravity on a slightly inclined plane.

Illustrated are two extreme locations—one suspended overhead from a walkway, the other in a basement.

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PNEUMATIC CONVEYING SYSTEMS-COMPRESSORS-FEEDERS AND ASSOCIATED EQUIPMENT

Positions and Projects — ACI Members

Research Projects Compiled by Committee 115—Research

The assignment of Committee 115—Research, "is to review and correlate research in concrete and reinforced concrete and to consider research methods and objectives." The committee has attempted to fulfill this assignment through the research sessions at the annual conventions, through the distribution of the annual compilation of research projects under way at the various laboratories, and through limited correspondence among committee members.

The annual compilation, "Research Projects in Plain and Reinforced Concrete—1953," is divided into three parts. The first part gives the names of all educational institutions that are conducting concrete research and lists the projects that they are working on. The second part provides similar information for noneducational organizations. In the third part the projects are classified under subject headings. This year, 72 organizations from all parts of the United States and from several foreign countries reported to the committee. These organizations included universities, highway departments, federal departments, cement companies, industrial laboratories, commercial laboratories, and various associations. The reporting organizations listed 461 different projects under way, which cover all phases of research in the fields of aggregates, admixtures, cements, and plain and reinforced concrete. If you did not secure a copy of this compilation at the last ACI convention, you may do so by writing the ACI office.

From the continuing interest of the ACI membership in the activities of the committee, it is evident that real needs are being satisfied. It would be presumptuous, however, to assume that the committee has reached the zenith of its possible usefulness; there must be various ways in which increased service can be rendered. Your reactions and suggestions in this connection are earnestly requested. Since the committee is anxious to have complete coverage of all research projects in its next compilation, all persons having suggestions or knowing of omissions are urged to initiate correspondence at once. No information will be given any publicity without the permission of the correspondent.

Address your suggestions and inquiries to:

Prof. George W. Washa
Secretary, ACI Committee 115
Engineering Building
University of Wisconsin
Madison 6, Wis.

Ohio block manufacturers organize

Ohio block manufacturers organized the Ohio Concrete Block Assn., Inc., at a meeting in Columbus, March 19. O. H. Seeger, immediate past president of the Columbus Assn., was elected to the office of trustee.

German engineers meet

The 83rd annual meeting of the *Verein Deutscher Ingenieure* (Assn. of German Engineers), held May 16-19 in Essen, Germany, featured as its theme "Power and Materials." More than 30 lectures on various engineering topics were given in the ten technical sessions; an innovation at this year's meeting was the engineering exhibition which was open to the public.

ASTM specification for vermiculite plaster

A new ASTM specification, C35-52T, has been written for vermiculite plaster aggregate and others, precisely detailing proper density, gradation, and other qualities. Under the new specification, the weight or density of vermiculite plaster aggregate ranges from a minimum of 7½ lb to a maximum of only 10 lb per cu ft.

ANNUAL REVIEW OF ACI TECHNICAL COMMITTEE ACTIVITIES

In the forefront of the never ceasing search for facts for the improvement of design, construction, manufacture, use, and maintenance of concrete products and structures are the 31 technical committees of the Institute. Actively engaged in increasing and interpreting the working knowledge of concrete, these committees are studying mass concrete, admixtures, lightweight aggregates, bridges, arches, building code requirements, slabs, precast and prestressed concrete, pavements, shear and diagonal tension, ultimate load design, chimneys, winter concreting methods, and other problems relating to the properties of concrete and its use.

Committee work within the last year has resulted in the revision of the ACI Standard on precast floor units and in process are Standards for the design and construction of reinforced concrete chimneys and for detailing reinforced concrete highway structures. Typical current committee projects include the development of a design practice for prestressed concrete, ultimate load design, building code changes, revision to methods of design of concrete mixes, properties of lightweight aggregates, and a recommended practice for the design of concrete pavements.

Following is a summary of technical committee activity during the past year.

Committee 115—Research

Highlight of the committee's activities was the sponsorship of the annual open session on research at the Boston convention, described in the April "News Letter." The committee is also responsible for gathering information on research activities in concrete from all possible sources, and publishing the material in an annual compilation. "Research Projects in Plain and Reinforced Concrete—1953," described in detail elsewhere in this "News Letter," carried reports from 72 organizations from all parts of the United States and several foreign countries. The reporting organizations listed 461 different projects underway on various phases of plain and reinforced concrete research. The committee has been expanding its activities and is making every attempt to contact all possible sources of information, not only in this country but also in other countries where significant research work is being carried out.

Committee 207—Properties of Mass Concrete

Committee 207 is working on three principal projects: (1) a task group is now engaged in a resurvey of 60 mass concrete structures last studied in 1937. It is contemplated that the committee will prepare a report of findings on the performance of mass concrete in service. (2) A proposed report on the properties of mass concrete is now under consideration. (3) An index is being compiled of all mass concrete dams over 200,000 cu yd, giving principal design features and factors affecting concrete behavior.

Committee 208—Bond Stress

Committee 208 has been relatively inactive, but "views with justifiable satisfaction the greatly improved status of deformed reinforcing bars which has resulted from the strenuous activities of the 1950 decade." This work provided the basis for ASTM Designation A 305 (Specification for Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement) and for the revision of the ACI Building Code in 1951 to capitalize on the improved properties of the new style (ASTM A 305) deformed reinforcing bars.

Within the immediate future it is probable that Committee 208 will offer for advancement to a Standard "The Proposed Test Procedure to Determine Relative Bond Value of Reinforcing Bars."

Committee 209—Volume Changes and Plastic Flow in Concrete

In 1947 an annotated bibliography of 170 references was assembled under the sponsorship of the committee and an extension of this bibliography has been under consideration. Since the advent of prestressed concrete has introduced problems which were not anticipated when the committee was organized, the Technical Activities Committee now has under consideration a plan

to reorganize Committee 209 with a view to a change in assignment to include problems introduced by prestressed concrete.

Committee 210—Resistance to Erosion in Hydraulic Structures

The committee is collecting information which will enable it to publish a report of benefit to designers and specification writers concerned with hydraulic structures. A preliminary draft of a report is in preparation with a view to publication before the end of the year.

Committee 212—Admixtures

The committee is presently engaged in preparing a revision to its 1944 report on "Admixtures for Concrete." In this report admixtures are presently treated in 12 different classifications, the advantages, limitations, and pertinent uses of each class being rather fully described. Final editing of the report is in progress, aimed at making it available for early publication.

Committee 213—Properties of Lightweight Aggregates and Lightweight Aggregate Concrete

The committee is actively engaged in gathering information on mineral lightweight aggregates. The ultimate aim is to publish two reports, one on lightweight aggregates and one on lightweight aggregate concrete. In the report, lightweight aggregates will be classified as to primary use: structural concrete, concrete masonry unit manufacture, and heat and sound insulating concrete. The lightweight aggregates will be identified on a basis of unit weight with a maximum value of 70 lb per cu ft for the sand size (minus No. 4 screen) measured in the oven dry loose condition.

Committee 214—Evaluation of Results of Compression Tests in Field Concrete

Believing that publication of information on the strength of concrete will build up confidence in concrete as a construction material, the committee is working toward publication of several reports. It is planned that the first report will be devoted to control cylinders and what they represent, including such information as (1) information on variation in control cylinders occurring on controlled projects; (2) number of cylinders required to furnish information on the strength of concrete for a given job; (3) relationship between cores, cubes, and control cylinders, as well as the effect of size and shape of specimen on compressive strength.

Committee 215—Fatigue of Concrete

The principal task before the committee at the present time is the preparation of a comprehensive and annotated bibliography on the fatigue of concrete. The references to be included in this bibliography have been collected and listed in a preliminary draft. Steps have recently been taken to enlarge the membership of this committee to include additional persons who have indicated an interest in fatigue of concrete.

Committee 312—Plain and Reinforced Concrete Arches

The most recent report (May 1951 JOURNAL) of the committee presented a general design method and a final report will be submitted as soon as an adequate standard can be prepared on current research. It is anticipated that the report will include information on ultimate strength design as it may be applicable to concrete arches.

Committee 314—Rigid Frame Bridges

During the past year, members of Committee 314 have been active on various problems concerned with the behavior of rigid frame bridges: (1) analysis (2) tests on full structures (3) historical notes and (4) tests on model structures. In February, 1952, the ACI JOURNAL published the paper "Analysis of Skewed Rigid Frames and Arches," by James P. Michalos. Tests on the San Leandro Creek bridge in California were reported at the recent meeting of the Highway Research Board, and the paper "San Leandro Creek Bridge Research Project," by T. Y. Lin and R. Horonjeff, was published by the Institute of Transportation and Traffic Engineering of the University of California. The committee has compiled historical notes on the development of the theory of rigid frames, and some portions of the test program on models of skewed rigid frames have been completed. These include the tests on model reinforced concrete beams with accompanying control cylinders, and tests on the model aluminum bridge. Work is now in progress on the building of a 1/10 scale skew slab, and testing should be complete some time this year.

Committee 315—Detailing Reinforced Concrete Structures

Highlight of the year's activities was the submission to the ACI Standards Committee of the "Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures," prepared in cooperation with the Concrete Reinforcing Steel Institute and the Committee on Bridges and Structures of the American Assn. of State Highway Officials. The proposed standard has now been released by the Standards Committee, and is described on p. 857 of this month's JOURNAL for discussion prior to being submitted to the membership for letter ballot.

It is anticipated that the Highway Detailing Manual will eventually form a companion volume to "Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315-51)," of which some 60,000 to 70,000 copies have already been distributed.

Another project under way is the preparation of a correspondence course in the detailing of reinforced concrete structures based upon the use of the Detailing Manual. The intention is twofold; first, that such a pamphlet supplemented by the Detailing Manual can be used as a text for a correspondence course which could be offered to students from technical high schools or from universities to create capable detailers; second, that with some modification such a publication could become the syllabus as a teaching guide for instructors of reinforced concrete drawing in university courses.

Committee 318—Standard Building Code

During the past year each of the 12 subcommittees of Committee 318 worked toward the revision of the Building Code (ACI 318-51).

In particular, comprehensive consideration was given to Chapters 6 and 7 on design and flexure, Chapters 8 and 9 on shear, diagonal tension, bond, and anchorage, Chapter 10 on flat slabs, Chapter 11 on columns and walls, and Chapter 12 on footings. The latter three chapters are scheduled for comprehensive revision.

The Committee has under consideration a proposal to add two chapters to the Code—provided text material of suitable quality and content can be prepared—on precast reinforced concrete and prestressed reinforced concrete. The addition of these chapters is not contemplated in the immediate future, since portions of the text must await results of present investigations by other ACI committees.

Committee 321—Design of Reinforced Concrete Slabs—Joint ACI-ASCE

Joined as an ACI-ASCE endeavor in February, 1953, the committee has had under consideration for some time a proposal for a definitive research project on the relative strength of different types of floor panels for buildings. The proposal is still under consideration, and changes are being drafted in it in the light of recently available experimental data. Plans are under way to run tests of different types of construction and design of slab and two-way slabs as well as the use of multiple panels for concrete floors.

Committee 323—Prestressed Reinforced Concrete—Joint ACI-ASCE

Highlight of the year's activities was the publication in the October, 1952, JOURNAL of "Proposed Definitions and Notations for Prestressed Concrete." This report, prepared by Subcommittee 3 under the chairmanship of Prof. C. P. Siess, is a step toward standardization of terminology of prestressed concrete. Since it is related to later work of the committee, and is basic to a common language in dealing with this subject, the committee has encouraged widespread discussion of the report.

Reorganized as a joint ACI-ASCE committee in 1952, there are now five subcommittees working on various aspects of prestressed concrete. The committee has started preliminary work on a manual of recommended practice for prestressed concrete for bridges (both highway and railroad) and buildings. It is anticipated that such a manual would cover materials, design, and construction. A steering committee was appointed to prepare an outline of the proposed manual. The outline was accepted by the full committee at its meeting in February, 1953. Task committees are now being organized to carry on the detailed work of preparing the manual.

Committee 324—Precast Reinforced Concrete Structures

The committee sponsored the session on thin-shell precast concrete at the Boston convention, with the papers published else-

where in this JOURNAL, and is engaged in the preparation of a standard applicable to precast concrete construction. The report, "Proposed Minimum Requirement for Thin-Shell Precast Concrete Construction," covers precast concrete of thin sections as distinguished from the conventional precast concrete which is generally believed to have been covered by the ACI Building Code. The proposed report will cover such items as materials, quality of concrete, allowable unit stresses, protective cover for reinforcement, fabrication requirements including curing, surface treatment, tolerances of individual elements, and erection requirements including connection devices and assembly tolerances.

Committee 325—Structural Design of Concrete Pavements for Highways and Airports

Progress has been reported in respect to the over-all objective of the committee, namely, the preparation of a recommendation for the structural design of concrete pavements for highways and airports.

The four subcommittees have prepared reports covering recommended design practice for subgrades and bases, slab dimensions, joints, and reinforcing. The immediate and major task confronting the committee is the preparation of this material for publication.

Committee 326—Shear and Diagonal Tension —Joint ACI-ASCE

Early in 1952, the Reinforced Concrete Research Council sponsored tests at the University of Illinois on the shearing strength of a reinforced concrete slab under a centrally located concentrated load. The laboratory tests have been completed, and a final report on this project should be available in the near future. A program of tests on the shear strength of concrete members without shear reinforcement has been developed, and the Reinforced Concrete Research Council has agreed to sponsor a test program consisting of 23 specimens at the University of Illinois. It is expected that fabrication of specimens will be started soon.

It has been suggested that the analysis of the tests be extended, if possible, to rectangular slabs and that the study also be broadened to include available tests on beams without shear reinforcement, so that ultimate strength formulas can be developed which will consistently apply to both beams and slabs.

Committee 327—Ultimate Load Design—Joint ACI-ASCE

As a result of exploratory studies, it was decided that several research projects would be necessary to secure information to fill the gaps in the knowledge of the performance of reinforced concrete members at or near ultimate loads in order to prepare a recommended design practice. The initial research project was a study of combined bending and axial loads on reinforced concrete members. This project has been completed and reported in "A Study of Combined Bending and Axial Load in Reinforced Concrete Members," by Eivind Hognestad, *Bulletin Series* No. 399, University of Illinois Engineering Experiment Station. The tests showed that Whitney's theory and a modification of Jensen's theory gave satisfactory agreement with observed ultimate load. Professor Hognestad developed a general inelastic flexural theory based upon his observations by means of which the behavior of the test specimen and the ultimate load could be predicted.

During the progress of the test program above, which involved only short-time loading, it was decided that a series of tests should be made to determine the sustained load capacity of eccentrically loaded columns. This project is nearing completion at the University of Illinois and the report is being prepared.

Knowledge of the mode of failure and the contribution of the components of a reinforced concrete flexural member to the ultimate load capacity when failure is due to shear and diagonal tension is still quite meager, even after some 50 years of research. A project was designed by the committee in the hope that information derived from it in conjunction with results of previous studies would lead to rather definite conclusions. The initial project has been completed. Analysis of the data from that project clearly indicated the need for additional tests covering an even wider range of variables. Fifty additional beams have now been tested and the results of the entire program will form the basis of a report now being prepared.

A third research project, which should develop information of value, has been proposed by the ACI-ASCE joint committee

on shear and diagonal tension. The proposed tests are to determine shear strength of concrete beams without shear reinforcement, in which the members are subjected to a combination of bending, direct load, and shear. Tests will be made of knee frames and T-frames. This work is now under way.

Since organization of Committee 327 as a joint ACI-ASCE effort in 1952, quite extensive studies have been made of the application of ultimate load theory to the design of beams and columns. The studies indicate satisfactory agreement between theory and practice. A preliminary draft of a code of practice is being prepared but final recommendations will not be possible until completion of the research projects now under way, and it is conceivable that further studies may be necessary.

Committee members have also been active in preparing papers for publication in the ACI JOURNAL, as is evidenced by the group of papers in the June, 1952, JOURNAL, and two papers by Professor Hogenstad in the October, 1952, and March, 1953, JOURNALS.

Committee 505—Design and Construction of Reinforced Concrete Chimneys

Highlight of the year's activities was the publication of the "Proposed Standard Specification for the Design and Construction of Reinforced Concrete Chimneys" in the January, 1953, JOURNAL. This report, replacing the tentative standard 505-36T adopted in 1936 by the Institute, was presented at the Boston convention for discussion purposes and will be presented to the Institute for adoption as a standard at the 50th annual convention in 1954.

When the committee was reactivated in 1949 to study the tentative standard, a careful canvass indicated that while the tentative standard had proved satisfactory as a basis of design, it was highly desirable to amplify the section pertaining to the temperature gradient through the chimney shell with respect to the many different types of lining which had come into common use in modern chimney practices. The tentative specification had included the first technical approach to this problem, but it was recognized that this was a "crude first step" in a difficult technical problem.

Several years' work culminated in the report published in the January JOURNAL. The tentative standard specification was completely rewritten, although the basis of design is essentially unchanged. Considerable additional material has been added on stresses due to earthquakes and the temperature gradient through the chimney lining and shell.

The proposed specification was written on the basis that it is advisable to include a definite method for determining the more important stresses in a reinforced concrete chimney with definite limits for the stresses so determined, even though the accuracy of the method of determination may be subject to further study and the value of specified constants may well be subject to the results of further experimental and test data. In particular, the committee would like to receive data covering tests or experiments which bear on the true temperature gradient through chimney linings, air space, and the chimney shell.

Committee 604—Winter Concreting Methods

The committee is considering revision of the ACI Standard "Recommended Practice for Winter Concreting Methods (ACI 604-48)" to provide more specific information for the benefit of the small builder, and the revision will be reviewed with this as the primary objective.

Committee 609—Compaction of Concrete by Mechanical Means

One of the important developments during the year was the change in the title of the committee from "Vibration of Concrete" to "Compaction of Concrete by Mechanical Means." This was occasioned by a request of one of the Institute members that attention be given to methods of compacting zero slump concrete. It was felt that a study of dry tamped concrete was within the field of Committee 609's activities, and should be added thereto. Since dry mixes having no measurable slump would probably need compacting through pressure or a tamping action that could not accurately be termed vibration, it was deemed necessary to change the committee's title.

The committee also sponsored the symposium on vibration of concrete at the Boston convention, described in the April "News Letter." The papers are scheduled for publication in the June JOURNAL. As a

result of one phase of the committee's activities, the paper "Some Effects of Vibration and Handling on Concrete Containing Entrained Air," by Elmo C. Higginson, was published in the December, 1952, JOURNAL. This paper discusses the removal of entrained air during compaction.

Committee 611—Inspection of Concrete

The committee's major task is revision of the 140-page *Manual of Concrete Inspection*, originally issued in 1941, of which some 20,000 have been distributed. Chief feature of the revision is a general re-examination and filling in of explanatory matter to be of greater use to the inspector. The list of standard specifications and references to more detailed specifications has been brought up to date and expanded. The revised manual will also include material on the proper handling of test specimens on the job, air-entrained concrete, and use of excessively wet consistencies.

Committee 612—Recommended Practice for Curing Concrete

In the course of the year, Committee 612 continued with the development of a report on curing, with a view to early availability of the report. There are many scattered data on the subject of curing, but little in the way of specific instructions as a guide to correct practice. A study of these data has revealed the nature of fundamental factors of curing concrete properly, and has defined the range of optimum values for these factors. The committee is also sponsoring basic research at the National Bureau of Standards on curing methods.

Committee 613—Recommended Practice for Proportioning Concrete Mixes

The present standard "Recommended Practice for the Design of Concrete Mixes (ACI 613-44)" does not cover accurately the proportioning of mixes containing entrained air, and the committee has been actively engaged in revising this report. This revised report is now under consideration by the Standards Committee.

Committee 616—Recommended Practice for the Application of Paint to Concrete Surfaces

The committee is now studying paint other than cement paints (covered in ACI Standard 616-49) for use on concrete surfaces. Development of a recommended practice for the application of organic base paint to concrete is now under consideration.

Committee 617—Specifications and Recommended Practice for Concrete Pavements and Bases

Since adoption of the ACI Standard "Specifications for Concrete Pavements and Bases (ACI 617-51)," the committee has been relatively inactive. The committee, however, recognizes the need to keep these specifications current, and is prepared to revise them whenever it is thought necessary.

Committee 620—Construction Joint Practice

This committee has been relatively inactive but is continuing a survey of existing practice in preparation and treatment of construction joints, with a view to preparing a statement of recommended practice.

Committee 621—Aggregate Selection, Preparation, and Handling

The committee is continuing work on the preparation of a recommended practice for aggregate selection, preparation and handling, but the early release of such a report is not anticipated. However, individual members of the committee spent considerable time on certain phases of aggregate production, and these reports have been published or are scheduled for publication in future issues of the JOURNAL. The first of these, "Production of Commercial Blast Furnace Slag," by Fred Hubbard, appeared in the April, 1953, JOURNAL, p. 713.

Committee 711—Precast Floor Systems for Houses

Committee 711 devoted most of its time during the past year putting into final form the revision of "Minimum Standard Requirements for Precast Floor Units" (ACI JOURNAL, Nov. 1952, p. 169). The revised Standard was presented to the Institute at the Boston convention, and has now been submitted to letter ballot of the membership. The revision changed the 1946 Standard by adding descriptions of assembled concrete block, precast inverted T-beam joists with precast filler block, and inverted precast slab and T-joist types of floor units. New information was incorporated on moment bar spacing, steel requirements, distance between lateral supports, and provision for tests.

Committee 716—High-Pressure Steam Curing

Four laboratories have continued the project begun in 1951 of determining the physical properties of high-pressure steam-cured block. This project is almost completed, and it is expected that several papers will be offered for JOURNAL publication. The first of these "Physical Properties of High-Pressure Steam-Cured Concrete Block" was published in the April, 1953, JOURNAL, p. 745; the second, "Chemical Reactions in High-Pressure Steam Curing of Portland Cement Products," appears in this month's JOURNAL, p. 841.

ACI participation in the work of committees of other organizations

ACI continues to be represented on committees of other technical organizations, particularly where their work is concerned with concrete. This is in addition to the joint committees organized by ACI and ASCE. Institute members have been active on eight American Standards Assn. committees, one American Society of Civil Engineers committee, four American Society of Testing Materials committees, one committee of the American Welding Society, and one committee of the Commodities Standards Division of the U. S. Department of Commerce. ACI has also been represented on the Concrete Reinforcing Steel Institute Committee on Awards, Advisory Committee of the Conference on Prestressed Concrete, Highway Research Board, and the Reinforced Concrete Research Council.

BRAB progress report

A recent report by the Building Research Advisory Board, a unit of the National Academy of Sciences–National Research Council, Washington, D. C., summarizes the activities of that organization during the past year.

William H. Scheick, executive director of BRAB, emphasized that BRAB was a research advisory organization and that its work precedes research (the determination of research needs and stimulation of action) or follows the performance of research (reports and utilization of results). BRAB, he said, works "for the integration of building technology."

Publications resulting from BRAB's conferences, surveys, and research studies have covered varied topics: weather and the building industry, fire resistance of exterior non-load-bearing walls, design of laboratories for handling radioactive materials, condensation control in buildings, housing and building in hot-humid and hot-dry climates, school building costs, survey of housing research in the United States, and conservation in building construction. The organization also publishes *BRAB Notes*, a newsletter type of publication.

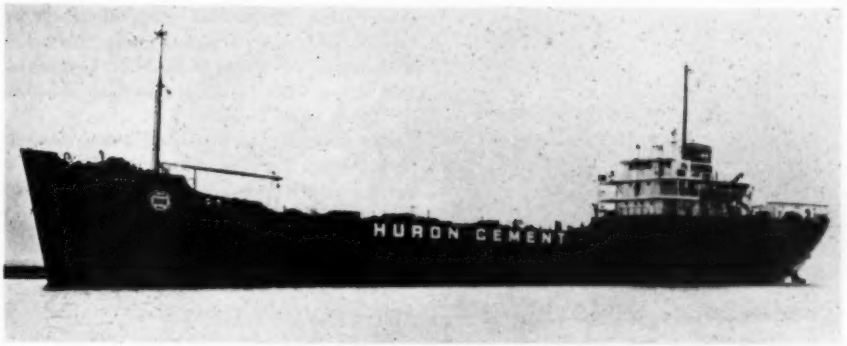
In discussing research correlation conferences, the report notes that one of the results of the conference on condensation control was the formation of the Committee on Condensation Control in Buildings.

In December, 1952, BRAB introduced a new type of conference for that organization with the conference on school building costs. Prior to this meeting, the research correlation conferences had been organized as symposiums for presentation before audiences of 150 to 350 people. The school costs conference involved only 40 people, with everyone acting as a participant. This working conference, reported Mr. Scheick, proved to be a good way to tackle a subject on which virtually no past research could be reported.

A large part of the funds for the activities of BRAB during the past year have come from contracts between the government and the National Academy of Sciences for specific studies by BRAB. Two major studies are currently under way.

Last year a study of conservation in building construction was completed for the Defense Production Administration. The contract was renewed and the study was continued without interruption into its second year.

In November, 1952, BRAB began a study for the Bureau of Yards and Docks, U. S. Department of the Navy, involving an examination of many of the temporary and semi-permanent buildings built by the Navy during World War II. Most of these buildings were designed for short-term use and both deficiencies and good points of design or construction are now quite evident. BRAB is to inspect this construction, evaluate its findings, and make recommendations to the Bureau of Yards and Docks that will be useful in the formulation of standards for buildings of this kind.



Huron Portland Cement Co.'s latest self-unloading bulk cement ship for Great Lakes traffic is the diesel powered motor vessel Paul H. Townsend

Huron adds to Great Lakes fleet

The latest addition to the fleet of the Huron Portland Cement Co.'s self-unloading bulk cement ships is the diesel powered motor vessel Paul H. Townsend, christened in Detroit April 30. The Townsend, named for Paul H. Townsend, president and treasurer of Huron Portland Cement Co. and Huron Transportation Co., was christened by Mrs. Richard E. White, daughter of Mr. and Mrs. Townsend.

The Townsend will be engaged exclusively in the transporting of cement from Huron's Alpena, Mich., cement mill to the company's 11 auxiliary distributing plants in various Great Lakes ports.

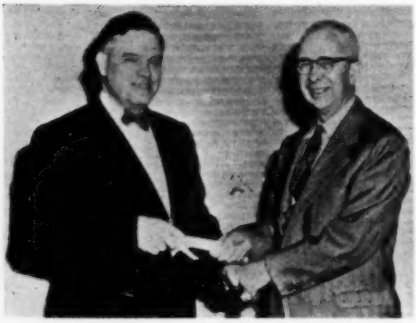
Built in 1945 as an ocean-going cargo vessel, the Townsend was purchased by Huron in 1951. The ship remained in ocean traffic until last summer when it was made ready for inland waterway passage at Hoboken, N. J. From there it was moved to New Orleans where the vessel was partially buoyed on pontoons to permit passage up the shallow channels of the Mississippi and the Illinois rivers to Chicago for final conversion.

Unlike most of the Great Lakes ships, the wheelhouse and all quarters of the Townsend are located aft. It is equipped with the latest navigational aids and equipment. The unloading machinery is remotely and automatically controlled by an extensive interlocking electrical installation. The ship can be loaded in 5 hr and unloaded in approximately 10 hr, due principally to the unloading equipment developed by Huron, the Fuller-Huron Air-Slide, an air-activated gravity conveyor.

Powered by five diesel engines with a total horsepower of 4320, the Townsend is 339 ft long with 50-ft beam and a load draft of nearly 24 ft. Its gross tonnage is 3580 tons. The vessel is equipped with a 1700-hp diesel engine for main propulsion, capable of maintaining a speed of 14 mph. In addition it is equipped with two 250-kw diesel generators for auxiliary power, a 1000-kw diesel generator to operate the self-unloading machinery, and a 15-kw diesel emergency generator.

The purchase and conversion of the Townsend was scheduled to coincide with completion of the 25 percent increase in production at the Alpena plant, designed to relieve current cement shortages in Detroit and other areas surrounding the Great Lakes. However, this expansion program has been delayed about one year, the company reports, due to lack of authority to proceed under the government controlled materials plan.

Huron Portland Cement Co. and its subsidiary the Huron Transportation Co. are among the pioneers in transportation of bulk cement in ships to auxiliary distributing plants. Such transportation was commenced by them from Alpena to Detroit in 1916 with the steamer Samuel Mitchell. As production increased at Alpena, distributing plants and ships were added, now totaling 11 distributing plants and four self-unloading bulk cement ships.



Raymond C. Reese (left) receives the 1953 CRSI Award from Prof. H. J. Gilkey, chairman of the Award Committee, at the 29th annual meeting of the Concrete Reinforcing Steel Institute

Raymond C. Reese receives 1953 CRSI Award

Raymond C. Reese, prominent Toledo, Ohio, structural engineer, was given the 1953 Award of the Concrete Reinforcing Steel Institute for "his contributions to reinforced concrete construction through design." The presentation was made on April 30, at the institute's 29th annual meeting, held this year at Pinehurst, N. C. Prof. H. J. Gilkey, chairman of the Award Committee, made the presentation.

The award is given for research contributing to the advancement of reinforced concrete, noteworthy contributions to the theory of reinforced concrete design, or improvements to reinforced concrete construction practices. The award consists of $500, accompanied by a Certificate of Award.

Mr. Reese, a graduate of Massachusetts Institute of Technology, is best known as an authoritative author in the field of reinforced concrete design, and his work as chairman of ACI Committee 315, Detailing Reinforced Concrete Structures. In 1939, he co-authored "Introduction to Reinforced Concrete Design" with Prof. Hale Sutherland. Probably his most important work is the "CRSI Design Handbook," which was published in 1951. This unique book eliminates time-consuming calculations by providing complete design data on reinforced concrete members.

An ACI member since 1936, Mr. Reese in addition to serving as chairman of Committee 315, is a member of the Standards Committee; Committee 208, Bond Stress; and 318, Standard Building Code. He is also a member of Joint ACI-ASCE Committee 326, Shear and Diagonal Tension, and 327, Ultimate Load Design.

His other professional affiliations include membership in the American Society of Civil Engineers, American Society for Testing Materials, National Society of Professional Engineers, and the International Assn. of Bridge and Structural Engineers.

The CRSI Award Committee, made up of representatives appointed by the American Concrete Institute, the Associated General Contractors of America, and the American Society of Civil Engineers, consists of the following members: Prof. H. J. Gilkey, chairman, head of the Department of Theoretical and Applied Mechanics, Iowa State College, Ames (representing ASCE); Charles S. Whitney, Ammann and Whitney, New York (representing ACI); and Earl J. Wheeler, Frank Messer and Sons, Inc., Cincinnati, Ohio (representing Associated General Contractors).

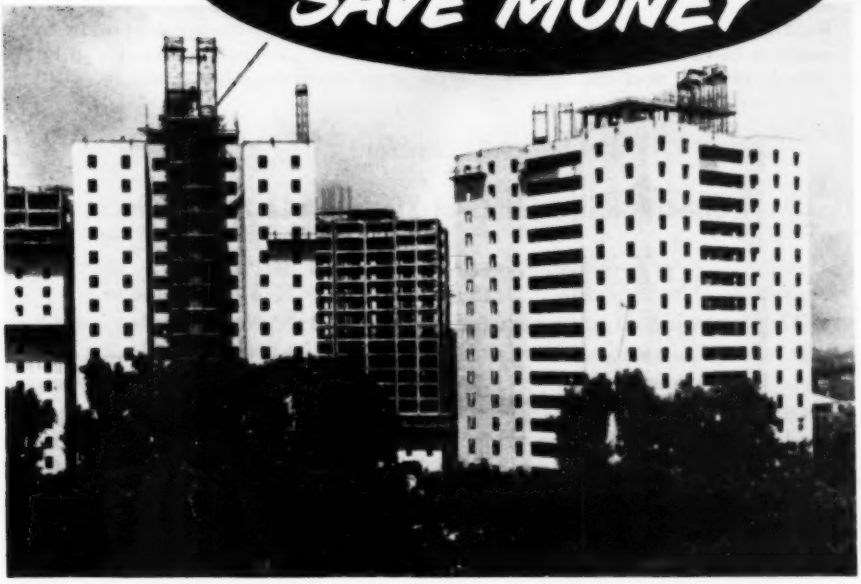
Looking ahead to 1954

With the successful completion of the 1953 convention in Boston, ACI's Technical Activities Committee is already looking toward the 1954 meeting in Denver and planning the program.

All those who have in mind offering papers for presentation at the 50th annual meeting should write to Institute headquarters no later than July 1, furnishing a synopsis which should make clear the intended scope of the paper and indicate features that, in the opinion of the author, will justify its inclusion in the program. Contributors should be prepared to have first drafts of manuscripts in the hands of the Technical Activities Committee for appraisal and acceptance by Sept. 15, 1953, and final manuscripts by Jan. 1, 1954.

From the replies received and suggestions from other sources, TAC will select the papers to make up each convention session. Write Institute headquarters about that contribution *you* believe merits a place on the program.

SAVE STEEL SAVE MONEY



Webb Housing Project, New York City
Contractor: Starrett Bros. and Eken
Architect: Leonard Schultze Associates
Structural Engineer: J. DiStasio and Company

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● This housing development got a good start in life—it was designed for *reinforced concrete!*

Builders know they can count on a saving in steel, a saving in costs, a saving in construction time with reinforced concrete. They know they can count, too, on durable strength . . . on structures that are inherently firesafe, highly resistant to wind, shock, and quakes. These are the qualities that *always* go hand-in-hand with reinforced concrete. Use it for your next building.

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SPECIFICATION FOR CAST STONE

Reprinted below is the ACI Standard "Specification for Cast Stone (ACI 704-44)." The Institute Technical Activities Committee is studying the advisability of reactivating this committee and the elimination, revision, or rewriting of this Standard. The TAC would like the benefit of members' comments on whether it is up to date, whether it is being used, and if it should be revised, how? Members are asked to send their comments to ACI headquarters so that TAC may have a cross section of member opinion to assist it in further study of this Standard. Please get your comments in by July 1, 1953, so that the matter may be given early consideration.

ACI Standard

Specification for Cast Stone (ACI 704-44)*

Reported by ACI Committee 704

The following proposed specification for cast stone is intended to supercede the specification tentatively adopted by the American Concrete Institute in February, 1929 (P3-A-29T) and which has since been generally recognized and used commercially as a standard for the physical quality of cast stone. The principal changes which have been made are an increase in compressive strength requirements from 5,000 psi. to 6,500 psi. and a reduction in permissible absorption for 7 per cent to 6 per cent. The absorption period has been increased from 24 to 48 hours, and the lower limit of 3 per cent on absorption has been eliminated.

I. GENERAL

1. The term "cast stone" shall be understood to mean a building stone manufactured from portland cement concrete, precast and set in place as trim or facing on or in buildings and other structures.

2. The minimum compressive strength of cast stone when delivered to the building site shall be 6,500 psi. when tested as 2 by 2-in. cylinders or 2 by 2-in. cubes in the manner hereinafter specified.

3. The average water absorption of cast stone when delivered to the building site shall be not more than 6 per cent by dry weight of the specimens when tested as 2 by 2-in. cylinders or 2 by 2-in. cubes in the manner hereinafter specified.

4. All aggregate used in the manufacture of cast stone shall be of known durable quality.

II. SELECTION OF SPECIMENS FOR TESTING

5. Specimens for both compression and absorption tests shall be cut from stone as delivered to the job or from regular stock in the yard.

*Adopted as a Standard of the American Concrete Institute at its 40th Annual Convention March 2, 1944; ratified by Letter Ballot of the ACI Membership July 28, 1944.

Samples from which specimens will be cut shall be selected by the purchaser or his representative.

6. Specimens of faced cast stone for compression tests shall be cut in such a manner that the specimens are composed of approximately one-half of facing and one-half of backing material. Specimens shall be tested in the position in which the cast stone is laid in the wall.

III. METHODS OF TESTING

7. Not less than 3 and preferably 5 specimens shall be required for each test.

8. Specimens for absorption test shall be dried at a temperature between 215 and 225 F. until the loss in weight is not more than 0.1 per cent in 24 hours of drying. They shall be allowed to cool to room temperature, weighted and then submerged in water at a temperature between 60 and 80 F. for 48 hours. The specimens shall then be removed from the water, the surface water wiped off with a damp cloth and the specimens weighed. The percentage of absorption is the difference in weight divided by the dry weight of the specimen and multiplied by 100.

9. Specimens for strength test shall be dried at a temperature between 215 and 225 F. until the loss in weight is not more than 0.1 per cent in 24 hours of drying.

10. If bearing surfaces of specimens for strength tests are not smooth, they shall be made so by grinding. If they cannot be ground to a smooth surface they shall be capped with a mixture of ½ part portland cement and ½ part plaster of paris, which shall be allowed to harden at least 5 hours before the test. The cap shall be formed by spreading the capping material upon a plate glass and pressing the specimen firmly on it making the cap as thin as possible. On specimens that are to be capped, all surfaces which are likely to come into contact with the capping material shall be shellacked and then allowed to dry before the capping is applied.

11. Load shall be applied through a spherical bearing block placed on top of the specimen in a vertical testing machine. The dimensions of the bearing block shall be the same, or slightly larger, than those of the test specimen.

12. Load shall be applied uniformly and without shock. The speed of the moving head of the machine shall be not more than .05 in. per min. when the machine is running idle.

13. Specimens shall be loaded to failure and the unit compressive strength calculated in pounds per square inch. The type of failure and appearance of specimen shall be noted.

Who's Who This Month

Arsham Amirikian

Arsham Amirikian, chief designing engineer, Bureau of Yards and Docks, Washington, D. C., tells about "Thin-Shell Precast Concrete—an Economical Framing System," p. 773.

A large segment of Mr. Amirikian's work in recent years has been in the field of thin-shell precast concrete construction and design of protective structures against conventional bombs and atomic blast. He has developed new methods of analysis and applied them to the design of shore structures, including such important projects as airplane hangars and industrial buildings, as well as auxiliary floating craft for the Navy, including the huge floating drydocks and gate caissons built of reinforced concrete during World War II. He originated and developed the modern precast concrete technique, utilizing thin-shell cells, ribbed panels and hollow section rigid framing.

Mr. Amirikian has received many honors in recent years, including the First Grand Award of James F. Lincoln Arc Welding Foundation in 1942, the Fuertes Graduate Medal of Cornell University in 1943, the Navy's Meritorious Service Award in 1946, the Lincoln Gold Medal of the American Welding Society in 1949, and the Concrete Reinforcing Steel Institute Award in 1952.

Mr. Amirikian graduated from Cornell University in 1923 with a civil engineering degree. He spent five years with private engineering and fabricating firms before joining the Bureau of Yards and Docks in 1928 as an engineer designing public works. He has been an ACI member since 1945.

M. R. Montgomery and T. G. Atkinson

"Thin-Shell Rib Panels Site Fabricated in Plastic Molds," p. 781, was collaborated on by M. R. Montgomery, operations manager, Trepte Construction Co., Inc., San Diego, Calif., and LCdr. T. G. Atkinson, CEC, USN, assistant resident officer in charge of construction, NAS, Miramar, Calif.

Mr. Montgomery, born into a contracting family, grew up in the construction industry. A 1928 civil engineering graduate of Iowa State College, he was in his family's contracting business until 1934 when he went to work for the army engineers as chief inspector for the Fort Peck Dam spillway. For the next four years he did considerable concrete testing and research in connection with the concrete used at the Fort Peck project.

From 1938-40 Mr. Montgomery was with the army engineers at Hansen Dam in California at which time he went on active duty with the U. S. Navy Civil Engineer Corps. His entire navy career from 1940-45 was spent as resident officer-in-charge or officer-in-charge of construction.

Commander Atkinson entered the navy as an ensign shortly after receiving a BS degree in civil engineering from California Institute of Technology. His naval duty during World War II was spent principally with the Fourth Construction Battalion performing advance base construction in Hawaii, Guam, and Okinawa.

Upon release from active duty in 1946 he engaged in structural design work in Pasadena and Los Angeles, Calif. In 1951 he was recalled to duty with the navy and assigned to his present position at the U. S. Naval Air Station.

While his civilian experience included design using all types of conventional materials, concrete was the most widely used. He had occasion to become familiar with precast well construction while working for Latisteel, Inc., who were early developers of this building technique. While working with Murray Erick Associates in Los Angeles most of his time was spent on the design of the UCLA Medical Center which is now under construction. This structure is of steel frame but employs concrete for walls, floors, roofs, column fireproofing, and foundations.

During his tour of duty at NAS, Miramar, his experience with concrete has been from the construction viewpoint. Facilities constructed at Miramar in which concrete was the principal material include runways and parking aprons, underground electric ducts,

and nearly all of the new buildings, large and small. Thin-shell, precast roof and floor panels as described in this paper are widely used in most of the buildings being constructed.

An ACI member, Commander Atkinson is a registered civil and structural engineer in California and an associate member of ASCE.

C. D. Wailes, Jr.

C. D. Wailes, Jr., president, C. D. Wailes Corp., Los Angeles, Calif., discusses "Factory Production and Field Installation of Thin Ribbed Precast Panels," p. 797.

Upon graduation in civil engineering in 1922 Mr. Wailes became connected with the structural engineering firm of Gardner and Howe, Memphis, Tenn. In 1926 he joined the Department of Building and Safety, Long Beach, Calif., and assumed charge of the department in 1927. He was in charge of the department at the time of the 1933 earthquake and was afterwards connected with repair and reconstruction of the damaged buildings.

For two years he was president of the Pacific Coast Building Officials' Conference and assisted in the development of the present building code of that area. From 1933-1934 he served as a consulting engineer, and from 1934-1940 was the district structural engineer for the Portland Cement Assn. During this time he assisted in the development of many types of precast construction systems, following their design and experimental work and field erection.

In 1941 the Wailes-Bageman Co. was formed, engaging in the manufacture and construction of precast concrete structures. The C. D. Wailes Corp. is successor to the former company.

Mr. Wailes is a past president of the Structural Engineers Assn. of Southern California, past president of the Structural Assn. of California, and a member of ACI and ASCE.

Charles C. Zollman

"Four Million Square Feet of Thin-Shell Rib Panels for Roof Framing," p. 809, is described in detail by Charles C. Zollman.

Mr. Zollman, chief engineer, Vacuum Concrete, Inc., received his engineering education under Prof. Gustave Magnel, Belgium, and is familiar with European concrete practices. He has translated Professor Magnel's book, *Le Beton Precontrait*, into English. Prior to his present position, Mr. Zollman was chief engineer, Prestressed Concrete Corp., Kansas City, Mo.

In addition to reviewing Dutch periodicals for the "Current Reviews" section of the ACI JOURNAL, Mr. Zollman is an active member of Joint ACI-ASCE Committee 323, Prestressed Reinforced Concrete. He has been an ACI member since 1948.

Ford J. Twaits and Martin M. Denn

"Fabrication and Erection of Precast Enclosure Framing for One-Story Barracks," p. 825, are described by Ford J. Twaits, partner, Ford J. Twaits Co., Los Angeles, Calif., and Martin M. Denn, Twaits, Morrison, Knudsen, Macco, Twentynine Palms, Calif.

Mr. Twaits, since receiving a civil engineering degree from Michigan State College more than 40 years ago, has been engaged in engineering and construction work. During this time he spent 10 years in structural engineering practice and designed the structural work for many buildings and industrial plants. All of his remaining time has been devoted directly to construction work as head of Ford J. Twaits Co. with the exception of five years when he was executive vice-president of Consolidated Steel Corp. and president of Consolidated Rock Products Co., Los Angeles, Calif.

Mr. Twaits has been a recognized leader in the construction industry in Southern California for the past 30 years. He has held many responsible positions in the Associated General Contractors of America and is a member of ACI.

Mr. Denn, after approximately five years of structural design work with various Los Angeles architectural and engineering firms, entered the construction field as an office engineer on the construction of the reinforced concrete underground Pershing Square garage in Los Angeles and then with the project described in his paper. On the latter job his duties primarily concerned the special design and fabrication work required to build the steel molds and forms.

Mr. Denn is a 1940 civil engineering graduate of the University of Arizona and is

Continued on p. 23

What do we know about construction markets?

As construction activity has grown—to more than $40 billion a year—and in importance to the whole economy—about one tenth of the total national product—our knowledge of it has lessened, claims the February issue of *Construction Markets*, a publication of the Construction and Civic Development Department of the Chamber of Commerce of the United States. In spite of the estimates of volume, activity, cost, etc., that are used in speech and press, said the Chamber of Commerce report, at no time has the government's statistical information about construction been of high dependability and today the quality of figures is poorer than at any time in the postwar period.

The report states that this condition is not due to lack of competence in government statistical agencies, but due rather to the failure of Congressmen and business men either to recognize the importance of sound data as a basis for market planning or to recognize just how inadequate the present data are for this purpose.

Statistics on construction activity

Monthly estimates of new construction activity (dollar value of work put in place), prepared jointly by the Departments of Commerce and Labor, are made by taking the source data—usually building permits or contract awards—and then applying a number of adjustment factors. Activity estimates vary a great deal in probable accuracy from fairly reliable figures for public utilities and government construction to almost guesswork for farm construction and maintenance and repair.

Almost certainly, reports *Construction Markets*, the published series represent an understatement of the actual amount of construction under way. Research by the Bureau of Labor Statistics indicated that, to account for all the building materials consumed in 1947, the official estimate for total new construction should be raised by 13 percent and the estimate for maintenance and repair work by 21 percent.

With a margin of error of such proportions, the Chamber of Commerce report warns not to look upon activity estimates as an accurate measure of what is actually being done. They are useful in indicating long-range trends, but may not be accurate enough to reveal turning points with much precision. However, said the report: "They are the best we have and they are the best that can be done with the present methods and available funds."

Statistics on housing starts

Monthly estimates of nonfarm houses started, compiled in the Department of Labor, Bureau of Labor Statistics, are, in part, made by taking residential building permits as reported to BLS from most of the areas requiring permits and applying adjustment factors. This part of the estimate covers the more important towns and cities and a few county jurisdictions, but it does not cover numerous small places nor outlying areas of metropolitan districts where permits are not required. To get a line on the number of nonfarm houses started in these non-permit areas, BLS makes an estimate from personal surveys in a sample of 96 counties, of which 32 are surveyed each month. This figure is enlarged to cover all non-permit areas by using an assumed ratio of the sample to the total.

The Chamber of Commerce report recognizes the impossibility of a complete monthly census of all houses started each month, but seriously questions the present system. Some of the short-comings are: not all permit areas send reports to BLS, many of the adjustment factors are based on out-dated investigations, the sample used for non-permit area estimates is exceedingly small, and the sample is selected on the basis of conditions prevailing at the time of the 1940 housing census with some adjustment factors based on the same base. "The result is far from being a dependable figure," emphasizes *Construction Markets*.

However, the report acknowledges that the present scheme of combining permit estimate for permit areas and personal surveys for non-permit areas could form the basis for a satisfactory estimate if some of the "glaring deficiencies now present did not exist."

Construction cost estimates

The Chamber of Commerce report is of the opinion that there are not any authori-

tative indexes of the cost of construction. Because of the variability in the combinations of labor, materials, and operating efficiency among the several types of construction, a single construction index is not practical.

The composite construction cost index developed by the Department of Commerce is a combination of about 14 privately compiled indexes for various types of construction weighted according to the relative importance of the major classes of construction. The private indexes, prepared by appraisers, builders, and publishers, are based mainly on weighted combinations of labor and materials prices.

The figures on the labor-materials components are themselves short of perfection, says the report, but the main difficulties with the cost figures is the inability to judge with accuracy what the weighting of the various components should be and to take into appropriate account the productivity of labor and operation efficiency.

The only other measure of physical volume is the square-foot-of-floor-area estimate which does not, however, provide complete coverage of all areas of the United States.

Financial statistics

Information on mortgage lending is compiled by the Home Loan Bank Board, but such information does not permit a breakdown by type of construction. In addition, there are the operating statistics of FHA, the VA Loan Guaranty Service, FNMA, and the Public Housing Agency. Out of this material, states the report, a fair picture of residential finance may be pieced together. However, the figures on financing of other types of property do not offer reliable knowledge of the current flow of funds into the construction market.

Current needs

For almost every other aspect of construction and real estate activity, says *Construction Markets*, there is almost nothing available on a current basis.

The report cites the need for information on characteristics and number of structures of various types, as well as data on the obsolescence and depreciation of structures.

The Subcommittee on Construction Statistics, Construction and Civic Development Department, U. S. Chamber of Commerce, believes that the most essential of the broad data series are (1) the dollar volume of construction put in place, and (2) the number of nonfarm dwelling units. They believe that the federal government should be responsible for the collection and publication of this basic data, and that effort should be concentrated on the improvement of these two series before more ambitious programs are advocated.

Who's Who

Continued from p. 21

a registered civil engineer in California. He is a lieutenant in the Civil Engineer Corps, USNR, and served on active duty both with the Bureau of Yards and Docks, Washington, D. C., and with the Construction Battalion overseas during World War II.

Benton H. Prock

"Careful Planning a Necessity in Building with Precast Concrete," p. 833, is contributed by Benton H. Prock, Prock Construction Co., Independence, Mo.

From 1929-1945 Mr. Prock was employed by the Corps of Engineers during which time he held various positions from inspector of construction materials to assistant construction engineer for military construction in the Kansas City Engineer District.

Since leaving the Corps of Engineers he has been self employed handling several projects for the City of Kansas City and other government agencies. Mr. Prock has been occupied with constructing the concrete portion of the Starlight Theater for Kansas City; building the substructure for a large power plant for the Northwest Electric Power Co-Op of Cameron, Mo., and numerous other projects containing small precast work. The project at Shumaker Naval Ammunition Depot was his first large precast work. Since reporting on this work he now has under contract the construction of 23 inert storehouses at Hastings, Nebr., which are identical with the ones at Shumaker, Ark.

W. C. Hansen

W. C. Hansen, manager, Research Laboratory, Universal Atlas Cement Co., Gary, Ind., presents "Chemical Reactions in High-Pressure Steam Curing of Portland Cement Products," p. 841.

Continued on p. 27

Why you get BETTER CONCRETE with DAREX AEA...

To get the full benefits of air entrained concrete always specify DAREX AEA

- *Places easier*
- *Finishes faster and better*
- *Has finer surface texture*
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DAREX AEA is not a by-product. It is scientifically formulated to do just one job: help you get better concrete. Its proven superiority *on the job* is a result of never-ending research in Dewey and Almy's extensively equipped cement and concrete laboratories that mirror *actual* field conditions!

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Membership in the American Concrete Institute

If this issue of the ACI JOURNAL has been of interest and useful in your work and you are not already a member, assure yourself of receiving it regularly by completing and sending in the membership application form below. The grades of membership are described overleaf.

All who have an interest in concrete and a desire to improve it through a nonprofit educational service in gathering, correlating, and disseminating information on design, construction, manufacture, use, and maintenance of concrete structures and products are eligible for Institute membership.

There are many opportunities in the Institute for technical committee activity, contributions from your experience in technical papers and the briefer "Letters from Readers" section, and in reviewing technical literature. Thus you can help further ACI's aim "to provide a comradeship in finding the best ways to do concrete work of all kinds and in spreading that knowledge," and at the same time benefit from the experiences of other Members.

(cut here)

Board of Direction, American Concrete Institute
18263 W. McNichols Road
Detroit 19, Michigan

Date _____

Individual Members, North America and U. S. Possessions	$15.00
Individual Members elsewhere	12.00
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Contributing Members	100.00
Junior Members—nonvoting (under 28)	7.50
Student Members—nonvoting (under 28)	5.00

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Of the annual dues, $12.00 is for the JOURNAL of the American Concrete Institute (except that dues for Junior and Student Members apply in full for the JOURNAL).

The undersigned hereby applies for _____ **membership**
(Individual, Corporation, Contributing, Junior, Student)

in the American Concrete Institute. Proposed by _____

For Corporation Membership, ACI representative will be _____

_____ (Date of graduation if Student)

_____ (Name, if Corporation)

Signature _____

For our records, please complete both sides of application.

EXCERPTS FROM BYLAWS: ARTICLE I—MEMBERS

Section 1. This Institute shall consist of Members, Corporation Members, Contributing Members, Junior Members, Student Members and Honorary Members interested in furthering the Institute's objects as set forth in its Charter.

Sec. 2. A Member shall be an individual.

A Corporation Member shall be a firm, corporation, society, agency of government or other organization. A Corporation Member shall name one individual as its representative who will enjoy all membership rights and privileges.

A Contributing Member shall be an individual, firm, corporation, society, agency of government or other organization wishing to give larger support to Institute activities through the payment of larger dues. Contributing Members, other than individuals, shall name representatives as do Corporation Members.

A Junior Member shall be a person less than 28 years old.

A Student Member shall be less than 28 years old and a student in residence at a recognized technical or engineering school.

An Honorary Member shall be a person of eminence in the field of the Institute's interest, or one who has performed extraordinarily meritorious service to the Institute.

Sec. 3. All classes of Members except Honorary Members and Student Members, shall be proposed by at least one Member of the Institute and elected by a two-thirds vote of the Board of Direction. An Honorary Member shall be elected by unanimous vote of the Board of Direction. A Student Member shall be proposed by a member of his school's faculty, who need not be a Member of the Institute, and elected by a two-thirds vote of the Board of Direction.

Sec. 4. All Members shall have all rights and privileges of membership as determined by the Board of Direction except that a Junior or Student Member shall not vote nor hold office. The status of a Student Member shall change automatically to that of Junior Member on the first anniversary of his membership succeeding the date on which he ceases to be a student in residence. The status of a Junior Member shall be changed to that of Member on the first anniversary of his membership after he becomes 28 years of age.

Sec. 5. Applications for and resignations from Membership and requests for change of representatives of Corporation or Contributing Memberships shall be presented in writing to the Secretary-Treasurer. Resignations may be accepted only from Members whose dues are not more than 60 days in arrears, except by special action of the Board of Direction.

(cut here)

Date of Birth _____
Month Day Year

Title or Position _____

Name of Firm or Organization _____

☐ **Business Address** _____

☐ **Resident Address** _____
(Please check address to which you wish mail and publications sent)

Nature of Firm's Business _____

Who's Who

Continued from p. 23

From 1924-29 Mr. Hansen served as a member of the Portland Cement Assn. Fellowship staff at the National Bureau of Standards, Washington, D. C., where he conducted research on constituents of portland cement and wrote a number of papers on phase equilibria in oxide systems.

Mr. Hansen was next associated with the research and production departments of the American Cyanimide Co. as research chemist and plant manager, and in 1938 he returned to the Portland Cement Assn. as senior research chemist. In December, 1944, he resigned his PCA position to become manager of the research laboratory of Universal Atlas Cement Co.

In addition to his ACI affiliation, he is a member of the American Chemical Society, American Assn. for the Advancement of Science, Sigma Xi, Phi Lambda Upsilon, and Gamma Alpha.

Committee 315

The summary of "Proposed Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures," p. 857, is reported by ACI Committee 315, Raymond C. Reese, chairman. Members of the committee are: Raymond Archibald, Louis F. Balser, Frank H. Beinhauer, A. G. Casto, James N. DeSerio, Everett E. Ebling, Lynn H. Hench, D. E. Hoeffel, Frank Kerekes, John M. Kerr, Charles J. Kuhn, Henry L. Neve, Paul W. Norton, George H. Paris, Fred L. Plummer, Allen M. Reese, E. E. Rippstein, John F. Seifried, and Howard M. Zimmerman.

MIT offers 28 summer programs for 1953

Twenty-eight special summer programs directed primarily to professional personnel from industry, government, and educational institutions were announced recently by the Massachusetts Institute of Technology, Cambridge.

One of the programs dealing with strain gage techniques will be held August 24-28. This course, offered by the Department of Mechanical Engineering under the supervision of Prof. William M. Murray, will include lectures on the theory of the strain gage and its applications to industrial problems.

Hot water for winter transit-mix operations

As an aid in winter transit-mix operations, Wel-Don Concrete Corp., Westfield, N. J., has developed an effective means of heating the water for mixing trucks at its ready-mixed concrete plant in Fanwood, N. J. The plant capacity is 750 cu yd of concrete per day, with a fleet of 20 Mack 10-wheel type, 6-cu yd units for transit mixing. Sand and gravel are not heated separately as the operators feel that any frozen lumps will be thawed out by the hot water during mixing.

The water heating arrangement as devised by Alexander Genard, general superintendent of the plant, provides for ample water heating capacity and storage without interruption of plant operation. It is said to be economical in fuel consumption and does not require operation before or after plant hours.

The installation has an immersion tube-fired 20,000-gal. water tank, 32 ft long x 10 ft diameter with a main firing tube of 12-in. diameter leading into two 10-in. diameter return flues. The oil burning system has a No. 782 Hauck proportioning oil burner with a 3-hp, 16-oz. blower, a ¼-hp oil pump, Wheelco electric eye and Flameotrol with a manual reset relay, and a Minneapolis-Honeywell Aquastat.

Water is heated during the same time that it is being used from the tank and during simultaneous refilling of the tank. Desired water temperature in the tank is 160 F during very cold weather and about 145-150 F for less severe days. The heated water from the tank flows by gravity to the loading stations for the mixer trucks. A maximum potential capacity is available to heat 10,000 gal. of water from 32 to 165 F at the rate of 10 deg. temperature rise per hour.

After a day's operation at 4:30 p.m., the tank contains about 19,000 gal. of water with a temperature of 165 F when the burner automatically shuts off. Overnight, there is only a loss of 4 to 10 deg. in water temperature. The tank is insulated all around with a 3 in. thickness of magnesia block and asbestos cement with wire reinforcing. Ends of the tank are left uncovered to warm up the inside of the building in which the tank, water pump, and oil burning system are located. The amount of water used during the morning causes the tank

contents to drop to about 14,000 gal. by about 11:30 a.m. when the burner is started. While the burner is firing, a pump is refilling the tank at the rate of 2000 gph, and at the same time, heated water is being used at the rate of 1000 gph by gravity flow to the plant. The burner consumes about 12 gal. of oil per hour for five hours, making a daily oil consumption of approximately 60 gal. By 4:30 p.m., the tank contains 19,000 gal. of heated water at 165 F at which time the burner flame is shut off automatically by means of the Aquastat actuating a solenoid oil shut-off valve. An electric eye flame safeguard then causes the burner, blower, and oil pump to shut down and remain inoperative. The burner does not start again until a manual reset relay is operated for subsequent manual relighting of burner.

The heated water is also used for washing out the mixing units. A standpipe connection from the tank has been installed so that water will be available for fire protection in the Wel-Don plant and two adjoining crushed stone and paving plants regardless of cold weather temperatures.

Symons awards contract

Symons Clamp and Mfg. Co., Chicago, Ill., recently awarded a contract to Rock Island Lumber Co., a subsidiary of Weyerhaeuser Timber Co., to manufacture its patented plywood panels used in the construction of concrete walls.

According to Symons officials, the increasing demand for the Symons system of concrete form construction which enables plywood panels to be used over and over again, necessitated the employment of outside manufacturing facilities.

Rakennusinsinoori

This Finnish technical periodical is now being received regularly at Institute headquarters. A volunteer reviewer is needed to keep Members informed of pertinent papers in this publication through the "Current Reviews" section of the JOURNAL. Those interested please write the Secretary.

Honor Roll

February 1—March 31, 1953

James A. McCarthy leads this month with five credits. F. Thomas Collins and J. E. Jellick are tied for second place with four credits each.

Enthusiasm and teamwork mean more members. Will your name head the Honor Roll next month?

James A. McCarthy	5
F. Thomas Collins	4
J. E. Jellick	4
Samuel Hobbs	3
Phil M. Ferguson	2
Henry L. Kennedy	2
C. H. Scholer	2

Are you "MEMBER CONSCIOUS"?

To maintain a healthy and dynamic position with regard to additional and continuing dividends of information on subjects interesting to **you** in the JOURNAL pages; the flow of new members (potential authors)—both those who benefit by and those who benefit ACI—must continue. Will you help to make it so by sponsoring a new member this year?

New Members

The Board of Direction approved 72 Individual, 3 Corporation, 15 Junior and 29 Student Members for April. With adjustments for losses, resignations and non-payment of dues, the total membership was 6106 on April 1.

Individual

ADDIEGO, BEN., El Cerrito, Calif. (Partner, El Cerrito Bldg. Matls. Co.)
AMBROSE, HOWARD GEORGE, Toronto, Ont. (Sales Engr., The Cooksville Co., Ltd.)
ANKIS, CONSTANTINE HARRY, Brooklyn, N. Y. (Supv., Madigan-Hyland Engrs.)
ANTONOFF, STEVEN, Detroit Mich. (Consulting Engr.)
AU, LI-TANG, New York, N. Y. (Engr., Hardesty & Hanover)
BLUMENTHAL, CARLYLE G., Albuquerque, New Mexico (V. Pres., Blumenthal Bros. Const. Co.)
BOYLE, G. M., New York, N. Y. (V. Pres., in Chge. of Sales, New York Trap Rock Corp.)
BRAMWELL, HENRY LESLIE, Birmingham, England (Struct. Engr., City of Birmingham)
BRASK, HENRY, Boston, Mass. (Struct. Engr.)
BURTON, WILLIAM C., Urbana, Ill. (Student, Univ. of Illinois)
CALDWELL, FRED S., Wheatridge, Colo. (Producing & Marketing Raw Clay)
CLOSE, ORLAND, Hayward, Calif. (Pres. & Mgr., Close Bldg. Supply, Inc.)
COLLINS, PROF. H. JOHN, London, England (Univ. College, Lon.)
COROMINAS, RICARDO, Vedado, Cuba (Civil Engr.)
COSSITT, ALFRED L., Earlville, N. Y. (Pres., Cossitt Concrete Prod., Inc.)
CRAIG, WILLIAM CLARK, Austin, Texas (Struct. Engr.)
DEMARQUE, G. M., Laurent, Que., Canada (Chf. Engr., The Preload Co., of Canada, Ltd.)
DE ST. MALO, ALBERTO, Panama City, Panama (Dean, Univ. of Panama)
DIAGLE, JACK R., Aruba, N.W.I. (Struct., Engr., Lago Oil & Transport Co., Ltd.)
ECKERT, EARL E., Austin, Minn. (Supt. of Constr. & Engrg.)
ERICKSON, ROY J. A., Wynnewood, Penn. (Chf. Struct. Engr., Day & Zimmerman, Inc.)
FITZMAURICE, R. M., Oakland, Cal. (Prod. Engr., Alta Bldg. Mat'l Co.)
FLECK, W. R., Wichita, Kansas (Chf. Engr., Board of Park Commissioners)
GAYER, RICHARD J., Bangor, Maine (Ass't Dir., Dept. of Public Works, City Hall).
GOMEZ-GONZALEZ, CARLOES E., Hato Rey, Puerto Rico, (Gen. Constr. Supt., Puerto Rico Indstr. Development Co.)
GONZALEZ G., ENRIQUE, Bogota, Colombia (Engr., Bridge Design)
GRAVEL, WILLIAM, Chicoutimi, P., Q., Canada (Design. Engr., Edifice Tremblay)
HAYS, HOWARD H., Bakersfield, Calif., (Gen. Engrg. Contr., Precast Concrete Products Co.)
HILKMEIER, L. G., Plainfield, N. J. (Chf. Engr., Worthington Corp.)
HOADLEY, ANTHONY, Schenectady, N. Y. (Prof. of Civil Engrg., Union College)
HOSTMARK, PETER H., Seattle, Wash. (Struct. & Civil Engr.)
HUMPHREY, DAVE, Danville, Cal. (Owner, Diamond Bldg., Material Co.)
JANCIK, ED. C., Houston, Texas (Gen. Sales Mgr., Texas Lightweight Aggregate Co.)
JOHNSON, J. W., Fremont, Ohio (Consulting Engr., Struct. Design & Bldg.)
KEITH, HUDIE C., JR., Washington, D. C. (Struct. Engr., Bureau of Yards & Docks, U. S. Navy, Wash., D. C.)
KELLAM, HAROLD S., Palo Alto, Cal. (Struct. Engr., Hall, Pregnoff & Mathew)
KOLESOFF, SERGE I., Altadena, Cal. (Struct. Engr. & Bldgs. & Structures)
MACFARLANE, CARL C., Kansas City, Mo. (Struct Engr., Jones-Hettelsater Constr. Co.)
MARVIN, RALPH E., Los Angeles, Calif. (Struct. Engr., Consulting)
MARSHALL, R., Montreal, P. Que., Canada (Ass't. Engr., Canadian Pacific Railway)
MASON, RICHARD E., Ithaca, N. Y. (Instructor, Struct. Engrg., Cornell Univ.)
MAYFIELD, ISAAC N., Waco, Texas (Field Engr., Portland Cement Assoc.)
MCCAMMON, DR. LEWIS B., JR., Alhambra, Cal. (Cons. Engr., Struct. Design, C. F. Braun & Co.)
MILES, FRED D., Urbana, Ill. (Ass't Prof. of Architecture, University of Ill.)
MYERS, WILLIAM I., Roanoke, Va. (Project Administrator, Hayes, Seay, Mattern & Mattern)
PATERSON, JOHN D., Ottawa, Ont., Canada (Engr., in Chge. Physical Testing Div., Dept. of Public Works Testing Labs.)
PELLMAN, RUSSELL J., Cincinnati, Ohio (Sales Engr., Aluminum Industries, Inc.)
POLIDOROFF, CONSTANTIN, Caracas, Venezuela (Struct. Engrg. Design., Instituto de la Ciudad Universitaria)
PRICE, WILLIAM A., Scranton, Pa. (Treasurer, Foam Crete Inc., and Wyoming Sand & Stone Co.)
PRINCIPE, FRANCIS J., Long Island City, N. Y. (Pres., Principe-Danna, Inc.)
RANDALL, JACK L., Los Angeles, Calif. (Gen. Contr., Engr.)
REJMAN, W., Kensington, Melbourne, Australia (Civil, Design Engr., State Electricity Comm. of Victoria)
RILEY, PHILIP J., Andover, Mass. (Engr., Mass. Northern Const. Corp.)
ROBERTS, ROBERT J., Moorhead, Minnesota, (Reg. Prof. Engr., Struct.—Civil)
ROHT, ROBERT T., Middleboro, Mass. (Ass't Civil Engr., Commonwealth of Mass., Pub. Works Dept.)
ROSANOFF, RICHARD A., Arcadia Calif. ("Desk Work", United Concrete Pipe Corp.)
SCHLAEPFER, CORRADO V., Mexico, D. F., Mexico (Hydraulis Supt., Mexican Light & Power Co.)
SLYH, JOHN A., Columbus, Ohio (Ass't Supv., Ind. & Gov't Research, Battelle Memorial Institute)
SNOW, EDGAR P., Providence, R. I. (Pres. & Chf. Engr., C. W. Riva Co.)
SPENCER, KEITH, El Monte, Calif. (Genl. Bldg. Contractor)
STAFFORD, FRANCIS W., Akron, Ohio (Consulting Engr., Civil & Field)
STANTON, JOHN J., Portland, Oregon (Architect, Commercial)
THERRIO, PAUL P., Los Angeles, Calif. (Los Angeles Branch Mgr., Universal Form Clamp Co., Chicago, Ill.)
TISSOT, HUMBERTO, Chicago, Ill. (Constr. Supt., Foreign Branches, Abbott Laboratories, Pan American Corp.)
TRACY, JACK S. H., Bremerton, Wash. (Manager, Kenyon Materials, Inc.)
TSUBOI, YOSHIKATSU, Toyko, Japan (Prof. of Univ. of Toyko, Dr. Engr.)
URBAN, GEORGE W., Bedford, Ohio (Supv. & Engr. Bldg., Leo W. Schmidt Co.)
WEIDNER, C. KEN, Beirut, Lebanon (Dean, American University of Beirut)
WILLIAMS, CARLETON S., San Diego, Calif. (V. Pres. & Gen. Mgr., L. C. Anderson Co.)
WILSON, J. THOMAS, Los Angeles, Calif. (Consulting Struct. Engr.)
WINNINGER, S. EDWARD, New York, N. Y. (Pres., The Nicholson Co., Inc.)
YOSHIDA, KIYOJI, Tokyo, Japan (Head of Concrete Laboratory, Nippon Soda Co.)

Corporation

ISTEG-STAHL-GES. MBH., Koln/Rh., Neumarket, Haus Lempertz, Gy. (Franz Mohr)
KELLEY MACHINE DIV., The Wiesner-Rapp Co., Inc., Buffalo, N. Y. (John L. Spencer)
ZONOLITE COMPANY, Chicago, Ill. (M. G. Quayle)

Continued on p. 31

Above is shown the membership certificate now available to all interested Individual, Corporation, and Contributing members. The actual certificate is 10 x 12 in. on parchment paper suitable for framing.

Return this order form together with your remittance—to avoid the added expense of billing—and your certificate will be mailed to you. Please allow 45 days for preparation of the certificate.

Please accept my order for a membership certificate at the price of $1.50.

☐ Check ☐ M.O. Enclosed

My name is to appear exactly as follows:

(Print or type)

Signature.....

Juniors

AUGER, LEONARD, Seven Islands, P. Que. (J. P. Porter Co., Ltd.)
BALLING, HENRY J., JR., North Tonawanda, N. Y. (Linde Air Products Co.)
BILLINGTON, DAVID P., Bloomfield, N. J. (Roberts & Schaefer Co.)
BUCK, JAMES ROY, Oxnard, Calif. (Naval Civil Engineering Res. & Evaluation Lab.)
GABRIEL, LESTER H., Flushing, N. Y. (Severud, Elstad, Kreuger)
GABATE Y LARROCEA, Mexico, D. F., Mexico (Felix Candela, Architect, Cubiertas, Alg. S. A.)
GARCIA-ITURBE, LEOPOLDO, Caracas, Venezuela (Gov't of Venezuela)
HOLZMACHER, ROBERT G., Bethpage, N. Y. (Chge. Design & Supv., Long Island Water Corp.)
HOVELSRUD, HERMAN J., Richland Center, Wis. (Designing, Sewage Treatment Fac., PUSOM, Casa Postale 879, Casablanca, Fr., Morocco
MCGINN, DONALD, Dubuque, Iowa (Struct. Designer, Durrant & Bergquist)
PONTON, LUIS ROIG, Ponce, Puerto Rico (Field Studies, P. R. Water Resources Authority, San Juan, P. R.)
SEAMAN, LAURIE W., New York, N. Y. (Design, Drftg., Field Supv., Freyssinet Co., Inc.)
SIMONS, LAURENCE B., Denver, Colo. (Struct. Design, Supv., Inspect., T. H. Buell & Co.)

Students

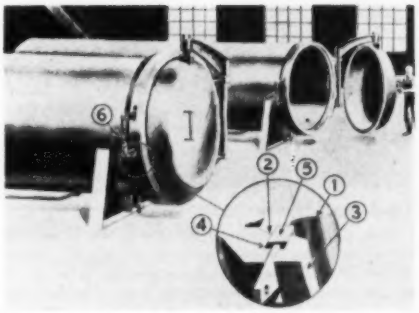
ALLEN, JOHN, Brighton, Mass.
BALLING, PAUL DANIEL, Notre Dame, Ind.
BORKON, BENJAMIN M., Joliet, Ill.
BRINER, LEWIS H., Austin, Texas
BROTHERSON, DONALD E., Chicago, Ill.
CHIU, ARTHUR N. L., Boston, Mass.
CRABTREE, ROBERT GLENN, Columbia, Mo.
DRY, JAMES RICHARD, Crystal Lake, Ill.
GRAY, A. JAMES, Urbana, Ill.
HALLIGAN, DARRELL W., Stanford, Calif.
INOUYE, SHINN, Chicago, Ill.
KUNEN, JAMES R., Brooklyn, N. Y.
LANE, CHARLES E., III, Auburn, Ala.
MASSA, AUGUST M., Urbana, Ill.
MORGAN, JOHN B., Urbana, Ill.
MURPHY, THOMAS JOHN, Notre Dame, Ind.
ORILLAC, RENE A., Notre Dame, Ind.
PEROLIO, ANDREW C., JR., Belleville, Ill.
PHELPS, ROBERT C., Stanford Univ. Cal.
PINILLA, EDWARD, West Lafayette, Ind.
SANDSTROM, JAMES A., Chicago, Ill.
SOLO RIO, JOHN, Urbana, Ill.
STELRICKI, ADOLPH F., Urbana, Ill.
STIVERS, ROBERT H., Menlo Park, Calif.
STUKENBERG, DONALD L., Chicago, Ill.
THOMPSON, DONALD E., Tiskilwa, Ill.
TWEEDY, JAMES E., South Bend, Ind.
WOJCIK, STANLEY, Chicago, Ill.

Tools, Materials, Services

Under this heading note will be made from time to time of producer literature of presumed technical interest (and available from its source for the asking) to ACI users of tools, equipment, materials, accessories and special services.

Concrete foundation system

A recent brochure of Franki Foundation Co. illustrates and describes Franki displacement caissons. The installation procedure is described graphically; details are given on reinforcing and concrete; and data presented on various jobs where the method has been used. —Franki Foundation Co., 114 E. 40th St., New York 16, N. Y.



The door (1) fits into an opening in the doorframe in such a way that a bevel on the door meets a bevel on the inner surface (2) of the doorframe. A flange (3) surrounds the doorframe. In this flange is an annular groove (4) in which a split ring (5) floats. The door is quickly opened or closed merely by expanding or contracting this split ring by means of a hand-operated jack (6) or a hydraulic cylinder

Autoclave doors

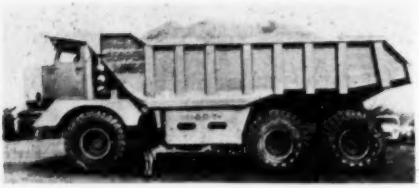
Blaw-Knox Co. has developed for pressure vessels a quick-opening door that can be opened or closed in a few seconds merely by expanding or contracting a split ring. The conventional door on pressure vessels is held shut by a large number of nuts and bolts and to open the door all the nuts must be removed—a task that takes at least 20 to 30 minutes. The doors have been built to withstand temperatures to 400 F. and pressures to 300 psi. Although originally designed for use on pressure vessels, these doors have been adapted for use on equipment operating at atmospheric pressure or under high vacuum.—Blaw-Knox Co., Process Equipment Dept., Farmers Bank Bldg., Pittsburgh, Pa.

Diamond blades for masonry saws

A new target "Super-Rim" diamond blade has been introduced by Robert G. Evans Co. Cutting segments on the rim have been increased 50 percent in depth to make possible increased blade life. Manufactured with a solid steel center, the diamond blades are available in 6 to 30-in. diameters. Types are available for masonry saws, power hand saws, and concrete saws, which have been adapted for wet cutting. The different specifications are marketed with a color code system: gold blades for hard materials, blue blades for medium hard materials, and red for soft products.—Robert G. Evans Co., 6315 Brookside Plaza, Kansas City 13, Mo.

Safety catalog

The National Safety Council's new 52-page "Occupational Safety Service Guide," No. 2.1, provides company safety directors with a complete catalog of the many and varied accident prevention aids available from the council. In the service guide, company safety men will find not only the tools they need to build their plant safety programs, but also the training aids available for instructing supervisors and workers. The catalog lists full line of posters, films, and booklets which are available to sell safety to the man on the job.—National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.



Off-the-highway truck

Dart Trucks has announced one of the largest off-the-highway trucks manufactured to date, the 60-ton Model 600. Its two Buda diesel engines, totaling 700 hp are mounted amidship of the truck's under-belly, one on either side. With a unique fluid drive, power from the engines is directed to each of its two rear planetary axles.

The truck is equipped with a maze of hydraulic systems for steering and hoisting, with pressures up to 1500 psi; a cooling system which requires almost 100 gal. of anti-freeze; rear springs with leaves of a special spring steel almost 2 in. thick; and a front end suspension which floats on captive air, similar to the arrangement used on the landing wheels of large aircraft. The captive air in the center swivel is said to provide an almost friction-free bearing upon which the whole front axle can turn. The power to steer is provided by hydraulic arms located on either side of the front axle.

Dart's new 60-tonner will be put to work at the Bagdad Copper Mines in Bagdad, Ariz.—Dart Trucks, 2621 Oak St., Kansas City, Mo.

Radiant heating slabs

Lee-Don, Inc., has released a bulletin on "Heatcrete," a densifier for radiant heating and structural slabs. The manufacturer states that the material is a high thermal conductivity aggregate added to concrete to increase density and heat conductivity of the slab. Panels made with it are said to reduce weight and increase rapidity of response to heat source.—Lee-Don, Inc., Box 556, Harmarville, Pa.

Concrete curing compounds

A brochure issued by Hunt Process Co., Inc., describes four concrete curing compounds, classified as clear, "tilt-up," black, and pigmented. The brochure covers application of membrane curing, recommended procedures, and types of equipment.—Hunt Process Co., Inc., 7012 Stanford Ave., Los Angeles, Calif.

Discussion closed January 1, 1953

Sept. Jl. '52

Some Effects of Vibration and Handling on Concrete Containing Entrained Air—Elmo C. Higginson

Cement Mortar Pipe Linings—J. Wright Taussig

Field Practice in Lightweight Concrete—John A. Murlin and Cedric Willson

Use of Concrete in Residential Construction—C. O. Christenson

Practical Design of Thin Retaining-Wall Footings—R. P. V. Marquardsen

Discussion closed February 1, 1953

Oct. Jl. '52

Analysis of Beam-and-Girder Framing with Known Column Settlements—Phil M. Ferguson

Proposed Definitions and Notations for Prestressed Concrete—Joint ACI-ASCE Committee 323

Effect of Compressive Reinforcement on the Plastic Flow of Reinforced Concrete Beams—G. W. Washa and P. G. Fluck

Heavy Duty Concrete Floors—E. E. Eckert

Inelastic Behavior in Tests of Eccentrically Loaded Short Reinforced Concrete Columns—Eivind Hognestad

Instrumentation and Strain Measurement in Welded Wire Fabric Reinforced Concrete Slabs—E. W Carlton and J. H. Senne

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